

## ABSTRACT OF THE DISCLOSURE

2 An original composite eye diagram is reformulated by deliberately re-aligning its component  
eye diagrams according to some appropriate standard. This 'forced-alignment' shifts the components in  
4 one or both of the time and voltage axes. Notice is taken of the shift(s) for each channel, and that shift  
data is appended to the data structures for the original components. The content of the data structure can  
6 be read in its original form, or, read and force-aligned. A force-aligned composite eye diagram created  
from the re-aligned components can then be displayed, investigated and evaluated with any of the  
8 existing tools that are used to analyze eye diagrams, simply by instructing the process that reads a  
component eye diagram data structure to reform that component as it is being read. Automatic forced-  
10 alignment of the component eye diagrams involves two steps. First, for each component eye diagram  
some specified property an 'earmark' having a (time, voltage) value is measured. Individual earmarks  
12 may be the centroid of an eye opening for each channel in the group, or representative point of transition.  
Second, each component is offset in time, voltage, or both, according to the difference between its  
14 earmark and some forced-alignment reference that is associated with the entire group of channels. That  
forced-alignment reference may be the earmark of a selected component eye diagram or an average of  
16 all of the earmarks in the group. Manual shifting of each component eye diagram by the operator is also  
possible. The forced-alignment shift data is appended to the eye diagram data structures. Patterns in the  
18 forced-alignment data can be discovered by inspection of a report showing the amounts of forced-  
alignment shifting. Channels in the report can be sorted according to their degree of alignment.